

Response of Waterbirds to Hazing with a Laser

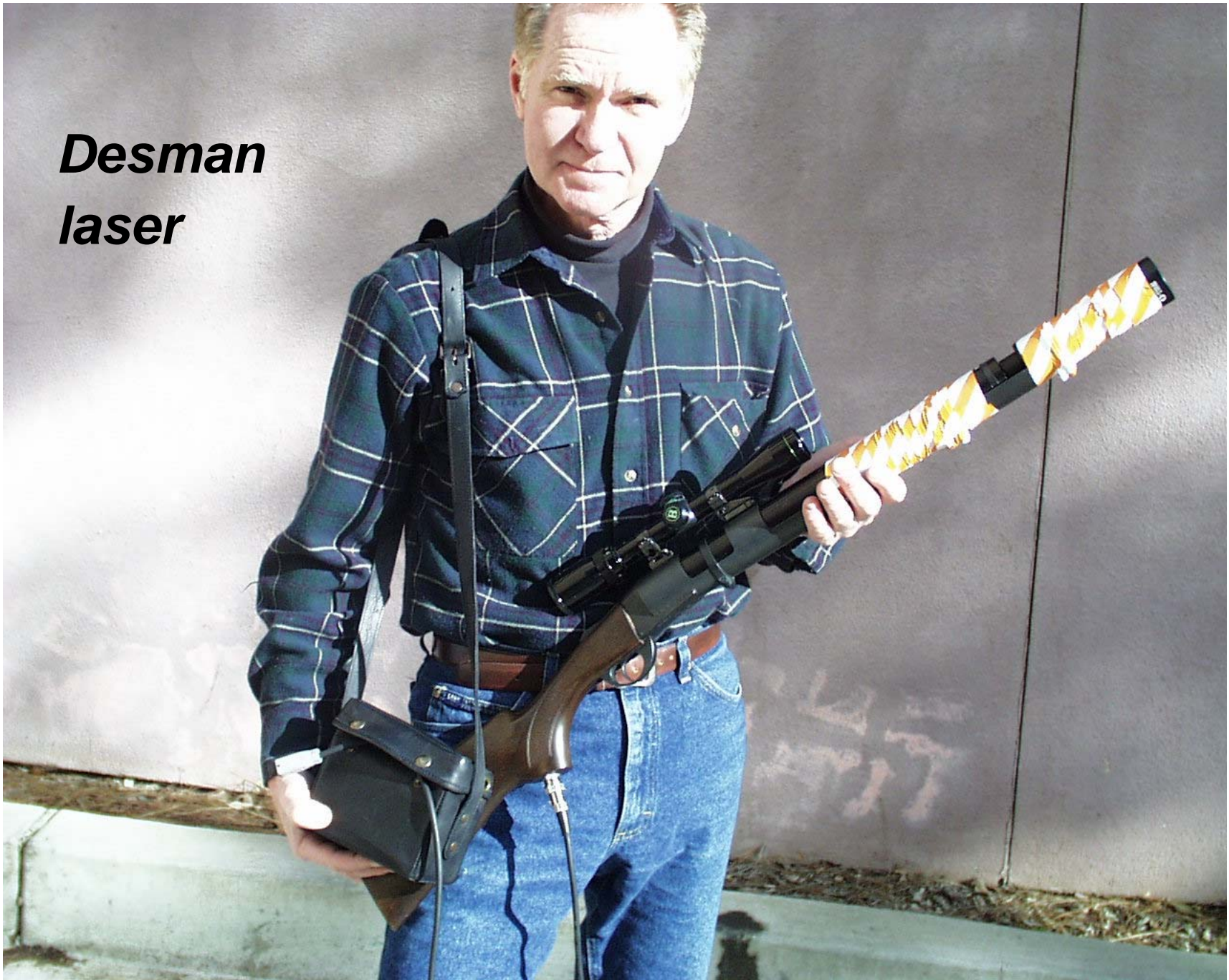
Hazing of birds can be an important part of minimizing the harm to wildlife during an oil spill. This presentation discusses some initial findings of the effectiveness of laser light in hazing by identifying species that respond to laser light and documenting their response.

The background image is a photograph of a calm body of water, possibly a lake or a wide river, under a hazy, overcast sky. In the distance, a line of bare, leafless trees is visible. On the water's surface, there are several white birds, likely swans or geese, and their reflections are clearly visible in the still water. The overall atmosphere is quiet and somewhat somber due to the muted colors and mist.

Response of Water Birds to Hazing with a Laser

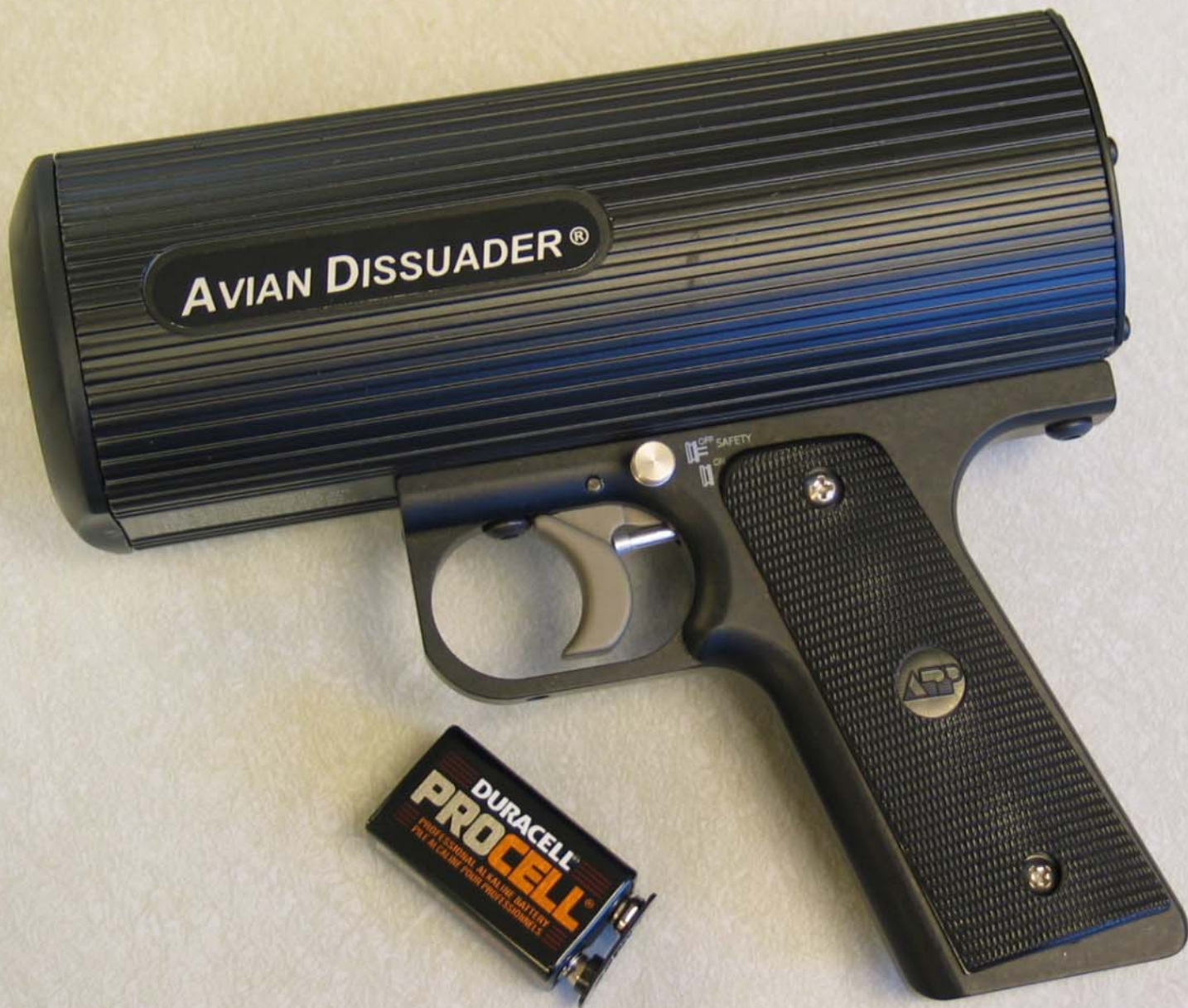
***Terrell Salmon – UCD
Paul Gorenzel – UCD
Randy Imai - OSPR***

***Desman
laser***



Dissuader





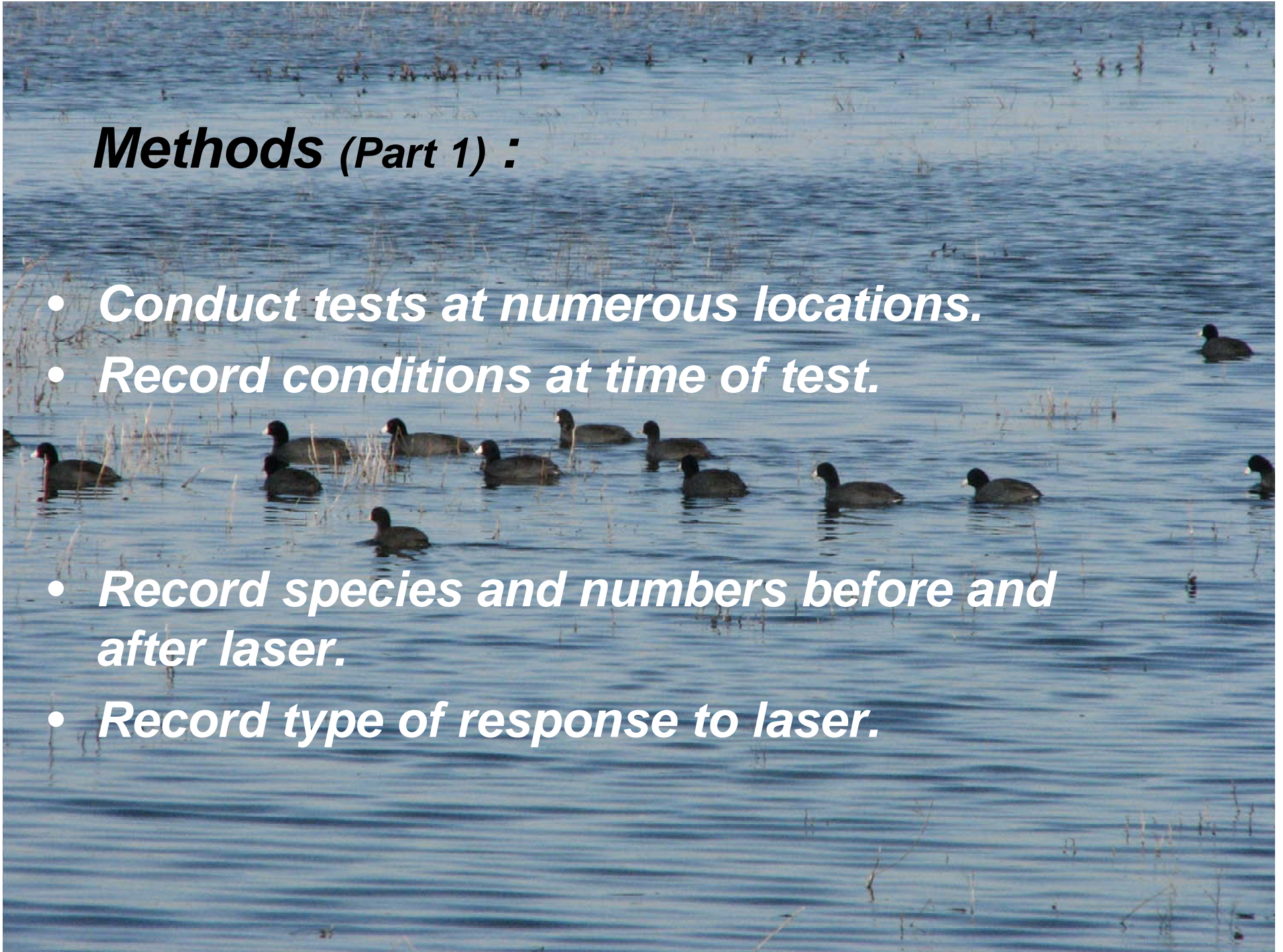
A photograph of a misty landscape. In the foreground, there are tall, dry reeds and some green plants. In the middle ground, a body of water is filled with many ducks. In the background, there is a line of bare trees under a hazy sky.

Objectives (Part 1) :

- ***Identify species that respond to laser light.***
- ***Document immediate response to laser light.***

Methods (Part 1) :

- ***Conduct tests at numerous locations.***
- ***Record conditions at time of test.***
- ***Record species and numbers before and after laser.***
- ***Record type of response to laser.***



Results (Part 1):

<i>Location</i>	<i>Test Days</i>	<i>Sessions</i>	<i># Targeted</i>
• <i>Collins Lake</i>	<i>3</i>	<i>8</i>	<i>130</i>
• <i>Lake Solano</i>	<i>3</i>	<i>31</i>	<i>170</i>
• <i>Rd 25</i>	<i>9</i>	<i>66</i>	<i>1357</i>
• <i>Putah Creek</i>	<i>2</i>	<i>21</i>	<i>338</i>
• <i>W Sacramento</i>	<i>1</i>	<i>3</i>	<i>5</i>
• <i>Total</i>	<i>18</i>	<i>129</i>	<i>2000</i>

Results (Part 1):

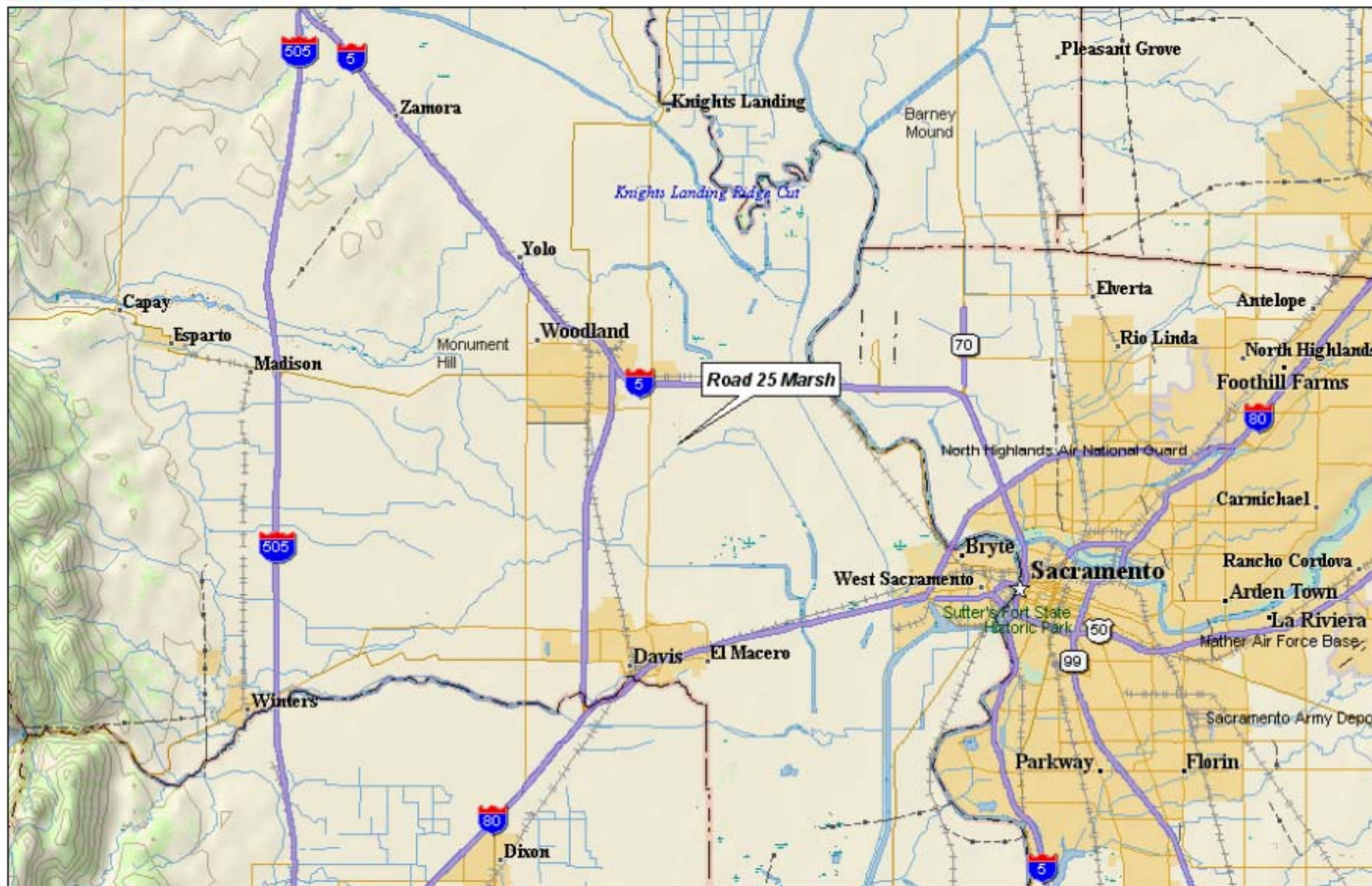
<i>Taxonomic Group</i>	<i>Species Sessions</i>		<i># Targeted</i>	<i># Responding</i>
• <i>Grebes</i>	<i>1</i>	<i>5</i>	<i>6</i>	<i>0</i>
• <i>Pelicans, cormorants</i>	<i>2</i>	<i>2</i>	<i>16</i>	<i>16</i>
• <i>Hérons, egrets</i>	<i>4</i>	<i>21</i>	<i>208</i>	<i>206 (99%)</i>
• <i>Geese</i>	<i>2</i>	<i>17</i>	<i>412</i>	<i>412 (100%)</i>
• <i>Dabbling ducks</i>	<i>3</i>	<i>28</i>	<i>372</i>	<i>43 (12%)</i>
• <i>Diving ducks</i>	<i>8</i>	<i>40</i>	<i>665</i>	<i>568 (85%)</i>
• <i>Raptors</i>	<i>2</i>	<i>3</i>	<i>3</i>	<i>1</i>
• <i>Coots</i>	<i>1</i>	<i>10</i>	<i>37</i>	<i>0</i>
• <i>Shorebirds</i>	<i>2</i>	<i>1</i>	<i>1</i>	<i>0</i>
• <i>Gulls</i>	<i>1</i>	<i>2</i>	<i>280</i>	<i>0</i>
• <i>Total</i>	<i>26</i>	<i>129</i>	<i>2000</i>	<i>1246 (62%)</i>

Results (Part 1):

Taxonomic Group	Response		
	None	Partial	100%
• Grebes	5	0	0
• Pelicans, cormorants	0	0	2
• Herons, egrets	1	0	20
• Geese	0	0	17
• Dabbling ducks	22	0	6
• Diving ducks	8	2	30
• Raptors	2	0	1
• Coots	10	0	0
• Shorebirds	1	0	0
• Gulls	2	0	0
• Total	51	2	76

Objectives (Part 2):

- ***Identify species that respond to laser light.***
 - ***Document immediate response to laser light.***
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- ***Determine if laser reduces bird numbers over the course of a night.***
 - ***Determine if laser has any lasting effect for 5 days after treatment ends.***



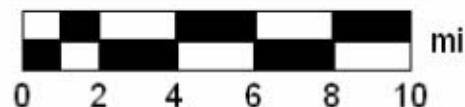
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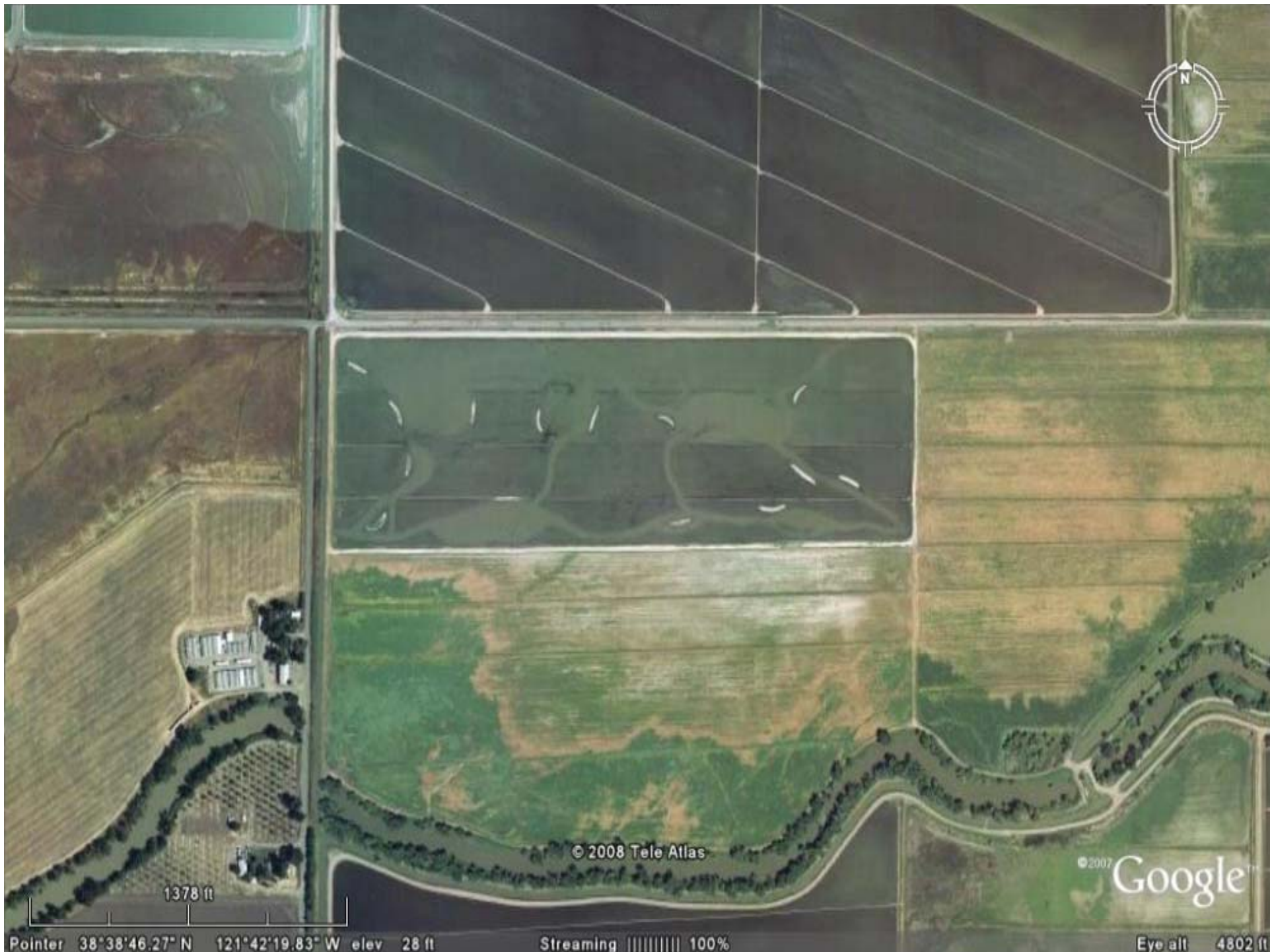
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MN (14.6° E)



Data Zoom 9-0



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1378 ft

Pointer 38°38'46.27" N 121°42'19.83" W elev 28 ft

Streaming ||||| 100%

Eye alt 4802 ft



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1378 ft

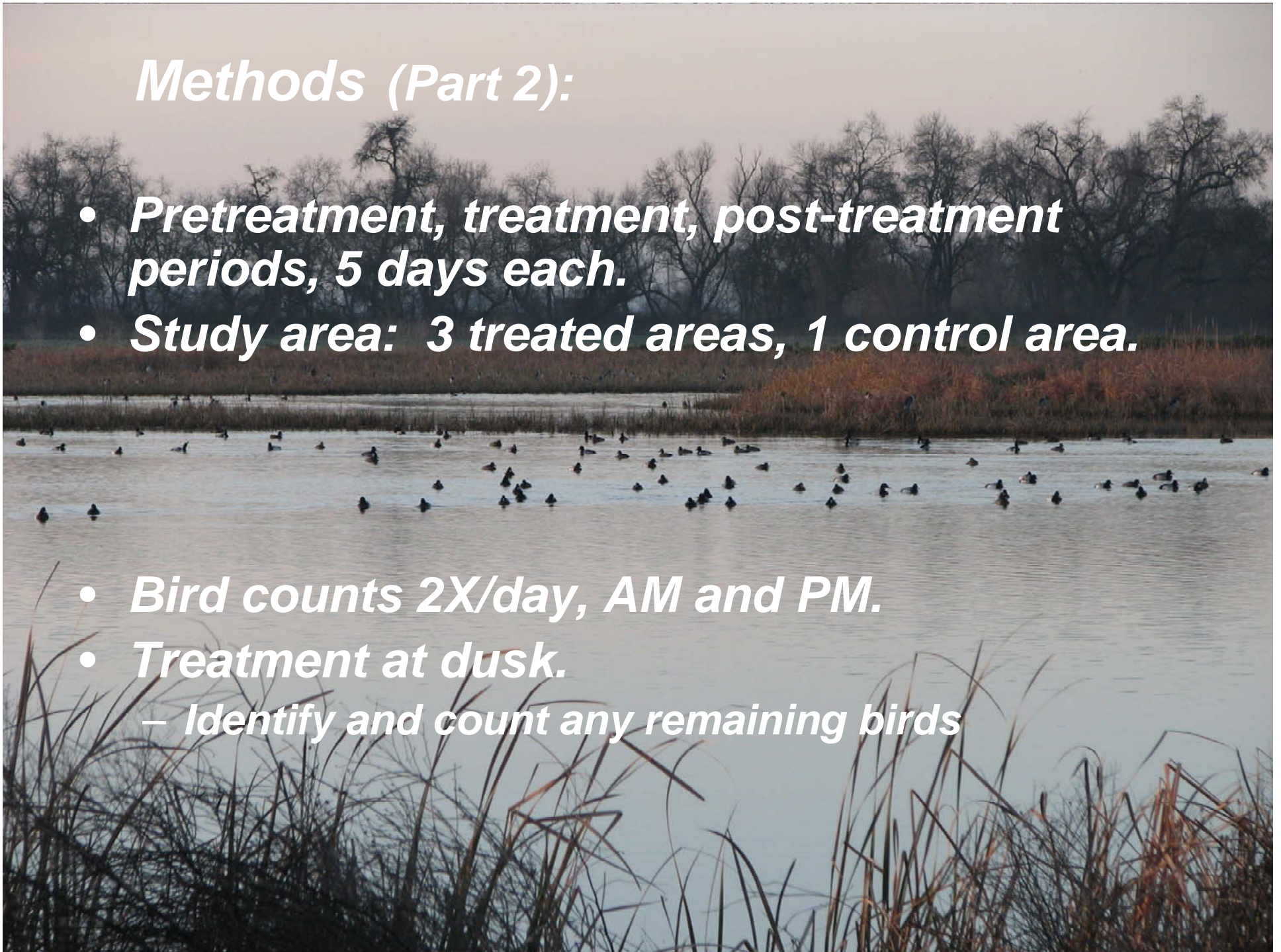
Pointer 38°38'46.27" N 121°42'19.83" W elev 28 ft

Streaming ||||| 100%

Eye alt 4802 ft

Methods (Part 2):

- *Pretreatment, treatment, post-treatment periods, 5 days each.*
- *Study area: 3 treated areas, 1 control area.*
- *Bird counts 2X/day, AM and PM.*
- *Treatment at dusk.*
 - *Identify and count any remaining birds*



Results (Part 2):



<i>Taxonomic Group</i>	<i>Species</i>	<i>Sessions</i>	<i># Targeted</i>	<i># Responding</i>
• <i>Hérons</i>	<i>1</i>	<i>6</i>	<i>1501</i>	<i>1470 (98%)</i>
• <i>Dabbling ducks</i>	<i>7</i>	<i>14</i>	<i>208</i>	<i>194 (93%)</i>
• <i>Diving ducks</i>	<i>7</i>	<i>46</i>	<i>1278</i>	<i>587 (46%)</i>
• <i>Coots</i>	<i>1</i>	<i>8</i>	<i>49</i>	<i>0</i>
• <i>Total</i>	<i>16</i>	<i>74</i>	<i>3036</i>	<i>2251 (74%)</i>

Results (Part 2):

Response

Taxonomic Group

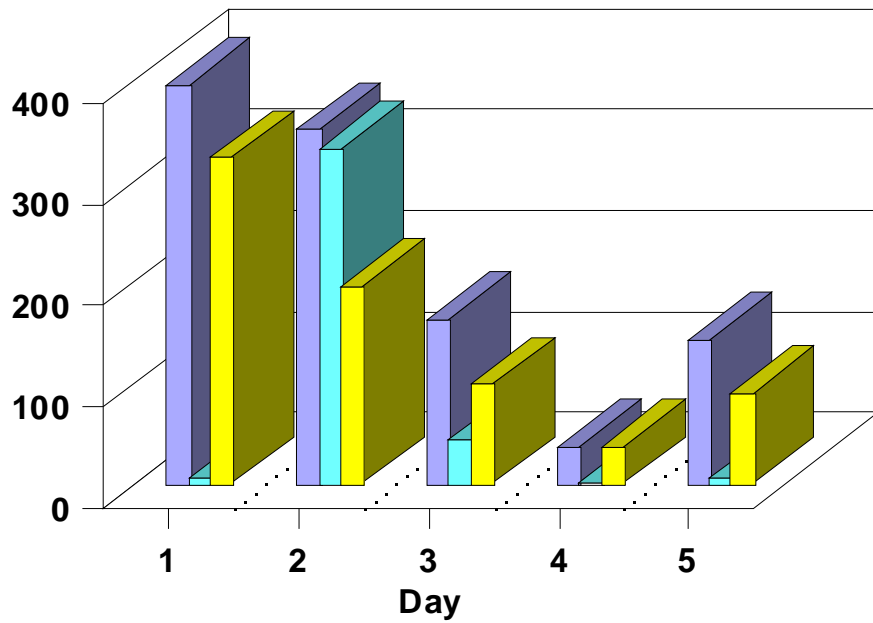
None

Partial

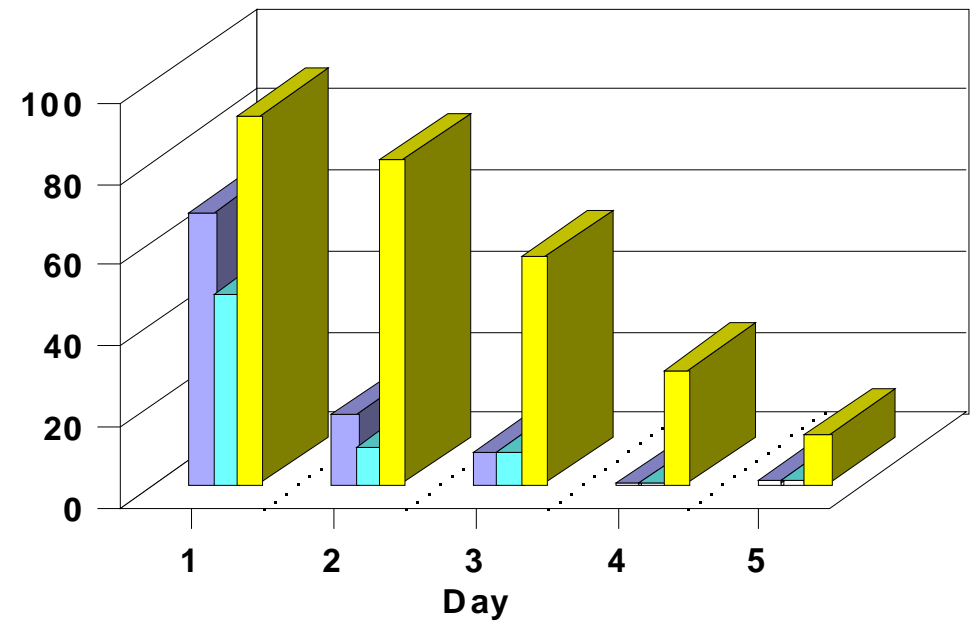
100%

• Herons	1	3	2
• Dabbling ducks	1	0	13
• Diving ducks	21	13	12
• Coots	8	0	0
• Total	31	16	27

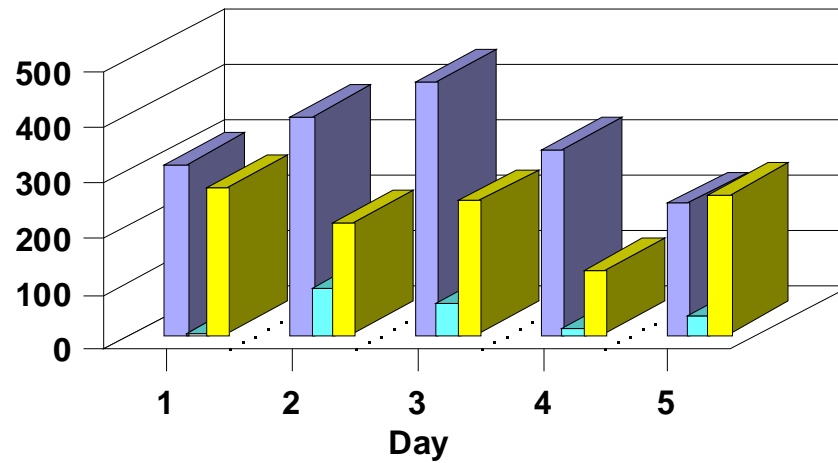
Area 2



Area 3

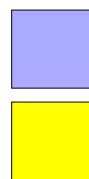
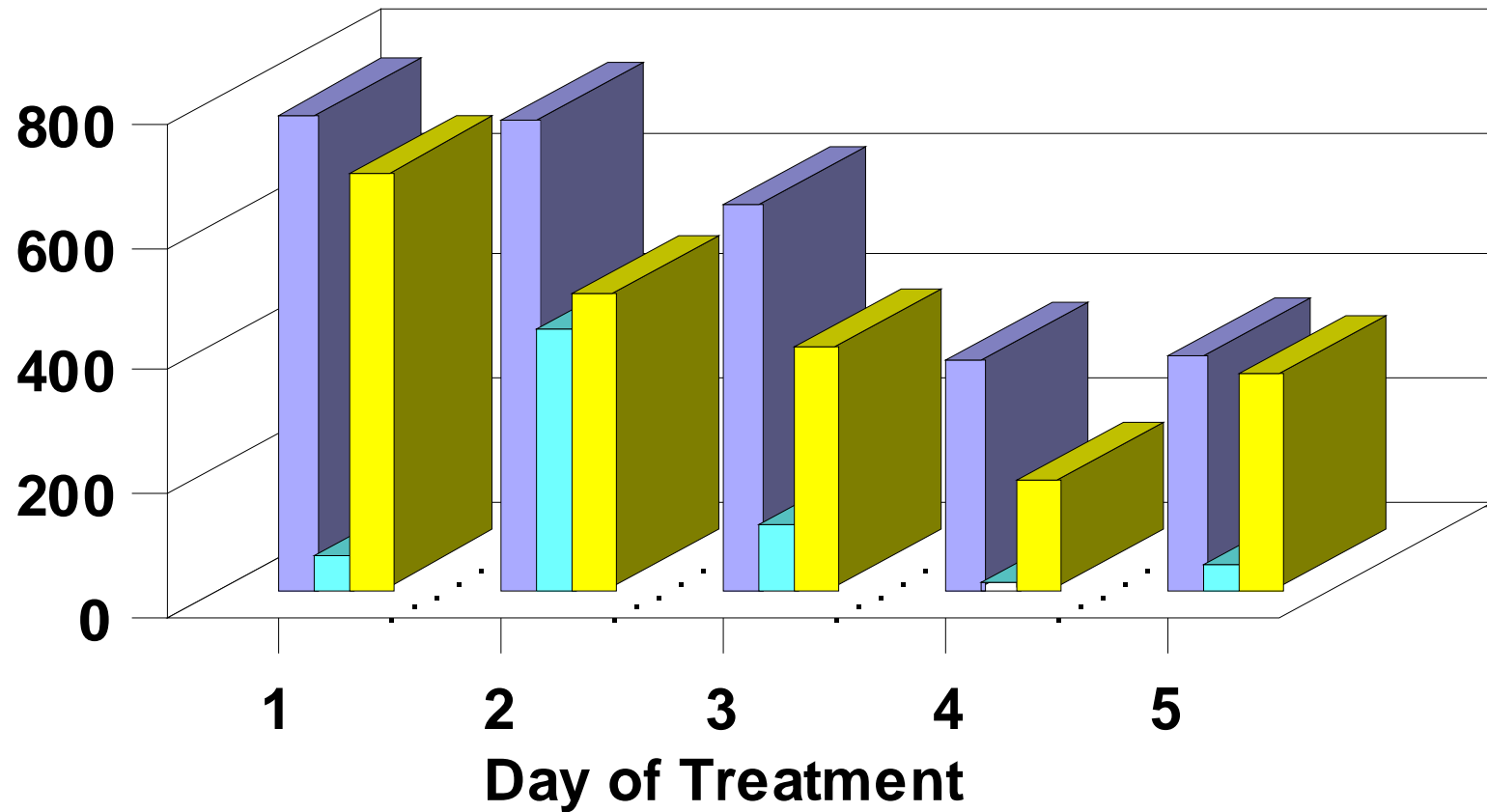


Area 4



Before Laser After Laser
Next AM

All Areas



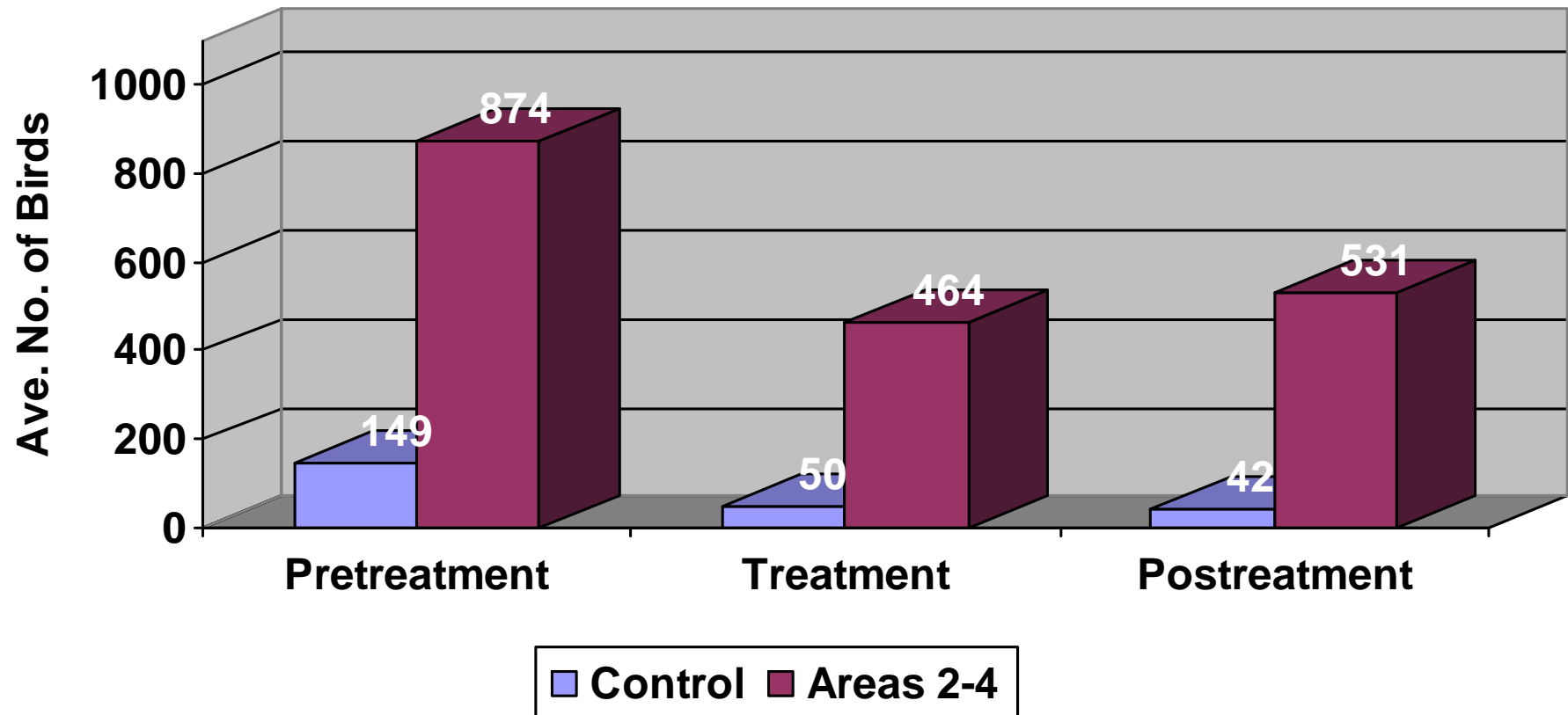
Before Laser



After Laser

Next AM

Bird Abundance and Temporal Pattern of Use



Current Research Status:

- *Field work has been completed.*
- *Data analyses are still in progress.*
- *Final conclusions have not been drawn.*



